

Claims

What is claimed is:

1. A method of testing a variable valve mechanism for an internal combustion engine, comprising the steps of:

operating the engine;

inducing a misfire at least in part by commanding a change to a state of a variable valve mechanism at a predetermined timing; and

detecting whether a misfire occurred.

2. The method of claim 1 wherein the inducing step includes a step of retarding an intake valve closing timing.

3. The method of claim 1 wherein the inducing step includes a step of retarding injection timing.

4. The method of claim 1 wherein the operating step includes a step of controlling the engine to operate at a predetermined speed; and the detecting step includes a step of detecting an injection quantity increase.

5. The method of claim 1 wherein the detecting step includes a step of detecting vibrational change from the engine.

6. The method of claim 1 wherein the inducing step includes a step of retarding an exhaust valve closing timing.

7. The method of claim 1 wherein the inducing step includes a step of reducing a maximum cylinder pressure.

8. The method of claim 1 wherein the inducing and detecting steps are performed sequentially on individual engine cylinders.

9. The method of claim 1 including a step of opening a valve via a cam rotation;
activating the variable valve mechanism before a cam dictated valve closing timing; and
deactivating the variable valve mechanism at a timing that will reduce a maximum cylinder pressure.

10. The method of claim 1 including a step of logging an engine fault;
identifying an engine cylinder associated with the logged engine fault; and
performing the inducing and detecting steps on the engine cylinder.

11. An electronic control module for an internal combustion engine comprising:
a computer readable data storage medium;
a variable valve mechanism testing algorithm recorded on the medium; and
the testing algorithm including an engine cylinder misfire detection algorithm.

12. The electronic control module of claim 11 wherein said testing algorithm includes a valve closing timing retarding algorithm.

13. The electronic control module of claim 12 wherein said testing algorithm includes a fuel injection timing retarding algorithm.

14. The electronic control module of claim 11 wherein said misfire detection algorithm includes an injection quantity increase detection algorithm.

15. The electronic control module of claim 11 wherein said testing algorithm includes an engine cylinder selection algorithm; and
a test result recording algorithm.

16. A machine comprising:
a chassis;
an engine mounted on said chassis and being equipped with at least one variable valve mechanism; and
means for testing said variable valve mechanism that includes means for inducing an engine cylinder misfire.

17. The machine of claim 16 wherein said means for testing includes an electronic control module having a variable valve mechanism testing algorithm.

18. The machine of claim 16 wherein said means for testing includes a diagnostic computer operably coupled to said engine.